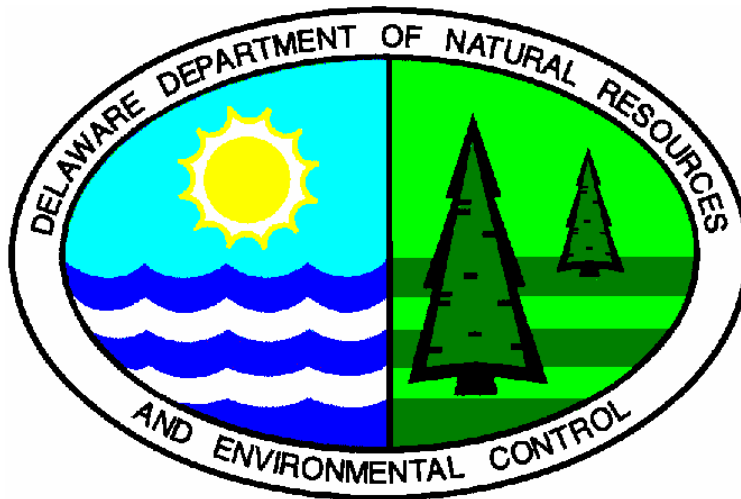


**State of Delaware  
Department of Natural Resources and  
Environmental Control**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
ONE STOP REPORTING PROGRAM  
120 DAY PLAN**



March 2002

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# **DNREC Data Management Vision**

## **Introduction**

The Information Management Vision of the Department of Natural Resources and Environmental Control (DNREC) is to provide any information the Department is custodian of to anyone within the State at anytime from anywhere. This can only be possible if the information is accessible over the Internet. This document details some of the steps involved in making this vision a reality.

This 120 day plan is pursuant to the requirement of the One Stop Grant DNREC received in January 2001. This plan details how DNREC proposes to accomplish the goals of One Stop to support data integration, public access, burden reduction, electronic reporting and stakeholder involvement.

The mission of DNREC is “to ensure the wise management, conservation, and enhancement of the state’s natural resources, protect public health and the environment, provide quality outdoor recreation, improve the quality of life and educate the public on historic, cultural, and natural resource use, requirements, and issues.”

To accomplish this mission, the Legislature granted DNREC the authority to perform certain tasks such as issuing permits, inspecting facilities, assuring compliance with standards and regulations, and requiring remediation where necessary.

DNREC has identified three objectives to accomplish the Information Management Vision stated above.

1. By 2005 DNREC will implement a means to effectively collect and manage 80% of the information that its partners require in order to manage for environmental results.
2. By 2005 DNREC will ensure public access to 50% of its public information by electronic means.
3. Integrate new and existing databases and increase the capacity of a shared information management environment by 80% by 2005.

In order to meet these objectives DNREC proposes to build an Environmental Information System (EIS) that will bring core environmental information together into one place where it is easily accessible to those within the Department and the Public. The vision statement for DNREC’s EIS is to “Provide a centralized location for environmental data. The System will have four components, including: an interactive geographic map interface, secure access to data by internal users, linkage to tools for environmental analysis by internal users, and public access to information through the use of the Internet.”

DNREC will expand the electronic document management already in place in one program to other programs. This will enable the Department to make the hard copy documents in the existing files available to the public over the web. This will go a long way in realizing its information management vision.

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The Department will pioneer some of the first initiatives in the eGovernment arena in the State by introducing sale of fishing and hunting licenses over the web. Other eGovernment initiatives planned are collecting underground tank fees, issuance of septic and well permits and receiving Discharge Monitoring Reports over the web. These initiatives will further spring board DNREC's efforts towards burden reduction and electronic reporting.

## **Organization of Information Technology within DNREC**

A full-time Information Systems Manager heads DNREC's data integration efforts. This manager has a staff of 21: five database/application development specialists; five network support specialists, seven Helpdesk technicians, one web master, one GIS specialist and two supervisors. The Information Resources Management (IRM) staff is responsible for maintaining the DNREC website and network, and for development applications including EIS.

To assist the full-time IRM employees, a Data Integration Advisory Committee (DIAC) was established. The DIAC is composed of middle managers and senior technical staff from each division. The DIAC is charged with coordinating data integration efforts within DNREC and with bringing together workgroups to tackle specific needs such as development of data standards and policies.

An Information Resources Executive Steering Committee has also been established. This committee is made up of senior level DNREC management. This committee's role is: to authorize, fund, and coordinate IRM activity; bring executive-level participation to decision-making and resource allocation, resolve disputes, and most importantly to resolve policy, organizational, legal, procedural, or political issues which inhibit the enterprise in exploiting its information resources to the optimum benefit of the enterprise and its constituents.

## **One Stop Building Blocks**

### ***Integrated Information***

In 1999, DNREC began work on a 3-year project to build an integrated environmental information system that will include facility, permitting, natural resource, enforcement and ambient environmental data. The system will improve the Department's ability to take a comprehensive approach to managing the environment to support initiatives such as the Coastal Zone Indicators, Total Maximum Daily Loads, and Whole Basin.

### ***Burden Reduction***

DNREC's 1999 One Stop grant application provided statistics related to burden reduction about three of its completed information management projects. The COMPAS system, which assists Kent County Planners in making zoning decisions, allows the planners to do now in only 15 minutes what used to take hours or days. DNREC's technology Enabled Permitting System, which combines well and septic permits and provides an online transaction processing system,

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reduced the number of steps in the permitting process from 118 to 20, reduced staff needed for permitting from 18-14, decreased permit turnaround time from 10 days to 1 or less, and reallocated more experts to the field. The Waste Transporters Permit System has resulted in productivity improvements of over 20% for DNREC staff and better service for permittees.

### ***Public Access***

DNREC continues to make improvements regarding public access to agency data. The Department procured a new high-end web server and transferred all websites to the new server. DNREC has also developed its Environmental Navigator, and Internet-based interactive GIS application that allows the public access to information about most regulated sites of interest to DNREC. DNREC's Superfund Branch has scanned over 1,000,000 pages of site files, stored in a relational database which is linked to the Department's public website. DNREC has received legislative mandate to make enforcement and pollutant release information available to the public over the Web and has been doing so for the last one year.

### ***Stakeholder Information***

DNREC has initiated the involvement of stakeholders in the development of DNREC's integrated EIS. During preparation of the Source Water Assessment Plan in 1999, DNREC sought input from the public on its Environmental Navigator. In addition, before the Navigator was launched, DNREC sought input from a stakeholder group consisting of environmentalist, industry representatives, and other government agencies. The Community Involvement Advisory Committee, composed of representatives from general public, industry, academia, local government, religious organizations, and environmentalist, will form a subcommittee to review the EIS as it goes through the development phase. DNREC also involved stakeholders in developing a set of 14 environmental indicators.

### ***Electronic Reporting***

DNREC uses electronic reporting extensively in the Air Quality Program, the Site Investigation Program, and the NPDES Program. In the Air Quality Program, the TRI data and Tier II data under the Community Right to Know Act are being submitted electronically on diskettes or over the Internet. About 55% of the data in these categories are submitted electronically. DNREC intends to improve the process of electronic reporting by web enabling the reporting system. In the Site Investigation Program, lab data are being received using EquIS's Electronic Data Delivery (EDD) module. DNREC is involved in Delaware's statewide e-government initiative.

### ***Geographic Information Systems***

DNREC has created a shared set of GIS base layers for the state. DNREC, in cooperation with Delaware's Department of Transportation, has also created digital orthophoto quads for the state with one-meter resolution. DNREC has created GIS coverages for nearly all facility types, for ambient monitoring sites, and for sensitive receptor locations in the state. DNREC program staff use several customized GIS applications in various environmental management activities.

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# **Integrated Environmental Information**

## **Background**

DNREC recognizes that economic, environmental, and social problems cannot be addressed in isolation. The Department is now attempting to manage the natural environment as a single, complex system. To reflect this new holistic perspective, the Department's ideas of doing business have changed; as a result DNREC has identified immediate needs for:

- A comprehensive approach to managing the environment
- Effective use information to make speedier and better informed decisions
- Making public data accessible over the Internet
- A higher level of data integration and management
- Greater stakeholder involvement in setting goals, priorities, and measures
- Providing managers and permit writers with information and tools needed to make sound environmental decisions.

As a result of the rapid rate of change in information technology and agency culture, information management at DNREC has been highly decentralized with each of its more than 50 programs (branches, sections, etc.) responsible for managing its own data. These programs together maintain over 160 databases in formats ranging from paper files to electronic databases. Although MS Access is the dominant electronic database product used by DNREC, 21 other different software products are being used by in the Department today to store information. Much of the information in the DNREC databases comes either from or is furnished to outside individuals, agencies, or organizations. Altogether some 182 outside groups have been identified that use or supply DNREC's data.

Over time, based on each program's unique set of needs, budget, skills and interest, each program has developed its own information management solutions ranging from paper files to sophisticated electronic permit management systems such as TEP (Technology Enhanced Permitting). Although these solutions to a greater or lesser degree meet the needs of the individual program to manage their own data, none were designed to allow data to be shared between programs. Even when programs store their data electronically, it is often very difficult or even impossible for other programs to utilize that data efficiently. Difficulties often arise due to problems linking different database products (dBase, Oracle, Access, Excel, FoxPro, ESRI shapefiles are all used at DNREC), when data is stored in locations inaccessible to the program needing the data (for example on a single user's PC), or when the data to be shared lacks common data definition standards and naming conventions. However, the most important barrier to sharing data is the lack of common identifiers that would allow data in one database to be authoritatively linked to data in another. For example, the same municipal waste landfill may be called the Northern Landfill on Air permits, the Cherry Island Landfill on NPDES permits and the Northern Solid Waste Management Center on Solid Waste permits. Without intimate knowledge of each program, it would be impossible to authoritatively link all the information on that site from the three programs or to know that NPDES's Cherry Island Landfill is not the same as Solid Waste's Cherry Island landfill which is another facility just down the road.

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The most important consequence of DNREC's decentralized data management is the difficulty it creates in doing comprehensive, placed-based, environmental analyses and management. Difficulties include long delays in completing analyses, potentially missing critical information, and the large amount of staff time required to respond to even simple requests. These difficulties not only effect DNREC's internal efficiency and quality of work but also directly affect our ability to provide timely, high quality service to our customers. Examples of customers routinely requesting placed-based environmental analyses include:

- buyers and sellers of real estate,
- teachers and students
- local, county and state planners,
- businesses requesting environmental permits,
- citizen groups developing pollution control strategies to meet TMDLs, and
- residents wanting to know what is going on in their neighborhood.

DNREC began moving towards department-wide data integration (integrated data is defined as data which is authoritatively, reliably, and transparently linked to other data) in 1985 with the creation of the DWUDS well permitting and completion database. In 1988 DNREC moved into the forefront of Geographic Information Systems (GIS) in the state with creation of its first position dedicated to GIS and its adoption of Arc/Info as the Department's standard GIS software. Since that time DNREC capabilities have increased rapidly in terms of both data management and GIS. Today nearly all programs store their key data electronically, ranging from simple single-user databases to sophisticated permit management and tracking systems such as our current wells and septic systems database, Technology Enhanced Permitting (TEP). Our GIS abilities have also progressed from creation of simple maps to creation of nationally recognized GIS-based decision support systems such as the Coastal Ocean Management Planning and Assessment System (COMPAS) resource protection system. Today DNREC is in the process of melding its data management and GIS capabilities into a GIS-enabled environmental information system.

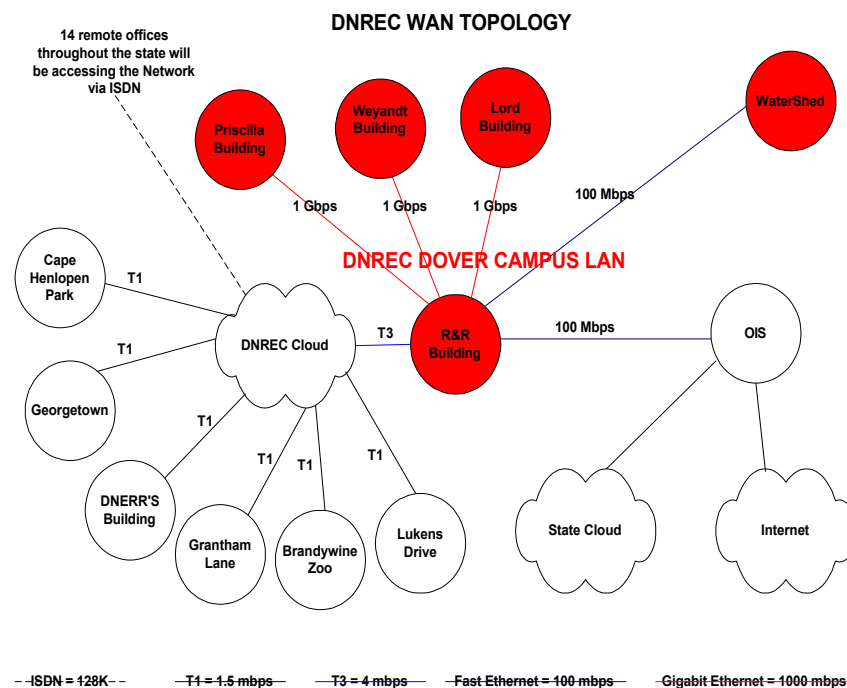
In 1999 the Department began work on a 3-year project to build an integrated Environmental Information System (EIS) that will include facility, permitting, natural resource, enforcement and ambient environmental data(see Appendix 1).This project is actually a continuation of a concerted effort to integrate data within the Department that began with the hiring of a Data Integration Coordinator in October, 1998. The system will improve our ability to take the comprehensive approach to managing the environment that is required to support Department initiatives such as Coastal Zone Indicators, Total Maximum Daily Loads (TMDLs) and Whole Basin. It will also allow DNREC to more effectively use the information we collect to make both speedier and better informed decisions. Finally, the system will make it possible to make the public data we collect accessible over the Internet. The Department laid out a three-step process to build the EIS that includes: 1) improving our computer communication backbone, 2) defining requirements, standards, and design options for the system, and 3) incrementally building and deploying the system. Steps One and Two have been completed.

Together the computer communication backbone and the EIS, when fully deployed, will be the data backbone of the Department.

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## DNREC's Computer Communication Infrastructure

Computer communication backbone improvements were completed in early 2000 with the addition, in the Spring of 1999, of two new application servers and over 90 gigabytes of storage space, replacement of three obsolete Banyan network servers in May 1999, and, in October 1999, installation of new network hardware that increases communications speeds in our headquarters building over ten times. DNREC contracted with the City of Dover to connect all five of our Dover offices and OIS together with fiber optic cables. This fiber network has increased inter-building communication speeds by 100 to 1000 times and reduced telephone data-line charges to the state. Together, the new network hardware and fiber optic network has enabled DNREC to host its own web sites at OIS with interactive map capabilities. These improvements have enhanced our ability to analyze process and supply data.



## The Data Integration Advisory Committee

DNREC established the Data Integration Advisory Committee (DIAC) to develop the agency plan for the EIS. The DIAC, established in August 1999, included representatives from management and senior technical staff from all divisions in DNREC and from OIS plus a support staff of four.

The objectives of the DIAC were:



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- 1) to develop a vision statement (or what DNREC wants the System to be) for the EIS,
  - 2) to develop requirements for the system (or what DNREC expects the System to be able to do),
  - 3) to formulate and execute a risk management plan for the project,
  - 4) to decide on an EIS Architecture (or high level design),
  - 5) to develop key data standards (to simplify communications, avoid confusion, ensure consistency, enhance potential of reusing development modules, reduce the burden on the regulated community and facilitate electronic submittals)
  - 6) to select a development platform and environment for the EIS, and
  - 7) to oversee the development of the EIS.

Within the DIAC, there were three workgroups: Data Standards, Design Options, and Information Flow/Needs/Storage Survey.

### ***Data Standards***

Charge: To develop, evaluate, and publish data standards for data fields in departmental databases. The first group of standards included fields related to name (person, company and facility), address, XY, latitude/longitude, date, tax parcel idea. Standards also included standard field name, field type and length, and permissible values. The data categories to be included in EIS are identified in Appendix 1.

### ***Information Flow/Needs/Storage Survey***

Charge: Design a survey of DNREC information flow (what information comes in from who, what information is generated internally, and what information is sent out to who, needs, and existing databases and custom applications).

### ***Design Options***

Charge: Evaluate design options for the departmental EIS (centralized vs linked vs data warehouse, feasibility of building on work done by other states)

DIAC and its associated work groups accomplished the following:

- developed a vision statement for the EIS;  
***DNREC's EIS will provide a centralized location for environmental data. The System will have four components, including: an interactive geographic map interface, secure access to data by internal users, linkage to tools for environmental analysis by internal users, and public access to information through the use of the Internet.***
- developed a high level description of the functionality and data desired in the EIS (system requirements);
- developed data standards for storing commonly used information such as names and address;
- completed an information flow survey of the Department that catalogues where we get the information we need, how we store it, and who uses it;

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- identified key risks to the project ;
  - explored opportunities for leveraging development work done by other states (New Jersey, Maine, Oregon, Pennsylvania, Utah, and Washington) who have built similar environmental information systems;
  - selected a database platform product for hosting the EIS (SQL Server),
  - created a high-level data model for facility data; and
  - investigated the feasibility of making our environmental information system part of the state data warehouse.

## **Information Flow Survey**

An information flow survey was developed to determine what environmental / programmatic / business information is needed to carry out the mission of the Department. At this time, administrative information (timekeeping, accounting, etc.) was not included. The survey had two parts: information that branches / sections / programs utilize, and information that branches / sections / programs own or generate. The survey revealed that:

- 49 branches / sections / programs responded to the survey
- 162 databases exist and are maintained within the Department
- the Department utilizes information from 182 sources outside the Department: other State agencies, local governments, the Federal Government, private industry, nonprofit organizations, academic institutions, and others
- information is accessed through 22 different types of database management software

## **Risk Management**

Risk is defined as a possible occurrence that will negatively affect the project (in this case, the development and implementation of an EIS) if it occurs. The DIAC identified sixty (60) possible risks associated with this project. These possible risks were then combined, where possible, and grouped into seven categories: Legal, Financial, Personnel, Regulatory, Policy, and Technical. The resulting grouping by category is as follows:

### ***Legal***

- FOIA vs. Non-FOIA (Confidentiality)
- Liability for Data

### ***Financial***

- Budget/100% Funding

### ***Personnel***

- Training
- Adequate Staffing

### ***Regulatory***

- Federal/State Statutory Requirements (Mission and Data)

### ***Policy***

- Buy-in from Internal/External Customers (Cultural Change; Improved Management Decisions, Efficiency via Technology; Visibility/Communication)

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### ***Technical***

- Design/Ease of Use
- Compatibility of Data Sets
- Evolution of Technology, Architecture
- Security

The DIAC then identified risk mitigation strategies for each of the risks.

## **Environmental Information System Description**

The DIAC evaluated the functionality and types of data needed to make an effective EIS for the Department. The DIAC evaluated a list of over 50 potential desired functionalities and system characteristics based on importance to the usefulness of the system and ease of implementation. The top twenty of these were chosen as key to the system.

The DIAC also evaluated thirteen classes of data for potential inclusion in the EIS. During this discussion the DIAC reached a consensus that all the classes of data being considered except criminal records (because of their confidentiality and privacy issues) should be included in the EIS. The DIAC then prioritized these data classes for order of inclusion in the EIS in the event that limited resources necessitated phased development of the system. GIS base layers were not ranked because they were considered a necessity.

Together the desired functionality and data define the essential characteristics of the EIS to be created for the Department; what it should include, what it should be able to do, and how the system should interact with its users. First and foremost, the EIS will be an easily accessible repository of key environmental and natural resource data that will facilitate sharing that data within the Department and with the public. Four basic categories of data are to be included in the system:

- ***Facility data*** (e.g. name, location, owner, contact information, permits, compliance information, activity reports - authoritatively linked across programs so that the user would be able to tell that the same site called X by one program and Y by another were in fact the same),
- ***Natural and Human Resource data*** (e.g. wetlands, soil types, wildlife populations, land use / land cover, census information - these data are all aerial in extent and will be included as GIS coverages),
- ***Monitoring data*** (e.g. results from air, water, soil, sediment, ground water, and tissue samples, animal and plant surveys, weather - from both ambient and targeted monitoring conducted by the Department, by other agencies, and by regulated facilities), and
- ***Base Map data*** (e.g. roads, water, aerial photos, political boundaries, park and wildlife area boundaries, tax parcels, watersheds - these GIS coverages allow the other information to be placed in geographic context).

The EIS will include both a form-based and a geographic interface to allow the user multiple ways to search for and display the information they are interested in. Once the desired information is found, the user will have the option of outputting that information either by choosing from a selection of standard reports and maps, creating their own custom reports or

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maps, or downloading the information for use with their own software. Environmental information routinely needed by staff will be available via the EIS. Sensitive data will be protected by database access security systems and only available to those individuals with access permissions. A survey will be conducted to identify and target the data and summary information derived from EIS databases for public use via the web.

Once the EIS is in place and fully operational it will allow both Departmental and public users easy access to answer questions such as:

- Has DNREC had any current or past dealings with a piece of property?
- What environmental permits are held by an industrial facility?
- Has DNREC conducted any benthic surveys on my favorite stream?
- Are there any environmental concerns with a piece of property being considered for acquisition for a park expansion?
- Where are the potential sources of contamination in my watershed?
- Are there any wetlands mapped on a property being considered for development?
- Have there been any violations of any permits at a facility?
- Where are ambient surface water monitoring points on a stream and what are the results of that monitoring?
- Where has DNREC collected sediment samples that have been analyzed for PCBs?

## Environmental Information System Architecture

There are a number of possible approaches to developing large information systems such as DNREC's EIS that vary in degree of centralization and how the information is interconnected. The four most common architectures being used by other states are:

- **Centralized Database** - All data to be shared is stored and maintained in departmental database.
- **Data Warehouse** - Programs maintain their own databases that meet departmental standards for minimum content and format. Program data to be shared is periodically extracted to a data warehouse where it is read-only. The data warehouse would contain a core set of enterprise level data that necessarily has write access that would allow authoritative links to be established between data from different programs.
- **Linked Programmatic Databases** - Programs maintain their own databases that meet departmental standards for minimum content and format. Data to be shared in these databases are linked as external tables to central departmental "linking" database. Program data in departmental database is read only but a minimal amount of linking data is maintained at the department level that allows data from different programs to be integrated.
- **Hybrid** - combined approach where programs requiring complex databases to meet their business needs (especially those that already have made major investments in software development, e.g. lab data and TEP) operate programmatic databases while other programmatic data is maintained in a central database. Data to be shared from programmatic databases would be uploaded to the central database periodically as in the data warehouse options.

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The Design Options subcommittee of the DIAC evaluated these options and recommended a centralized system. A centralized system is easier to maintain, easier to enforce data standards and easier to realize cost savings through shared development.

The Design Options subcommittee evaluated Oracle and SQL Server client/ server-database product options for hosting the EIS. Both products were determined to have the features and performance capabilities needed to support the needs of the EIS. Oracle advantages are:

- greater potential to expand capabilities with purchase of extra cost options,
- better web integration, and
- better programmability.

SQL Server advantages are:

- more capabilities "out of the box",
- easier to administer,
- better links to outside databases,
- better data warehousing capabilities "out of the box",
- applications developed in Access 2000 can be directly migrated into SQL Server without modification (Access is the dominant database product used by the Department), and
- significantly lower cost

Based on these factors SQL Server Enterprise Edition (unlimited users) was selected as the database product for the EIS.

## **Benefits of EIS**

The following benefits will be realized from the development and deployment of the EIS:

- Improved Effectiveness of DNREC Operations
  - Planning & Coordination
  - Decision Making
- Improved Efficiency
  - Permit Processing
  - Response to Public Inquiries, etc.
  - More Productive Use of Staff Time
- Improved Access to Environmental Information
  - Increased Public Awareness
  - Fosters More Favorable Business Climate
- More Comprehensive Perspective
  - Performance of regulated facilities
  - Status of natural resources
  - Enhanced ability to do "place-based" environmental analyses

## **DNREC Strategies to Develop EIS**

In keeping with DNREC's goals of holistic, place-based environmental management, the

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development of the EIS has been strategically divided into nine tasks. Tasks One through Four are the foundation to the EIS project:

1. ***Complete Data Integration Work Plan:*** DNREC will finalize its tactical plan for enhancing its environmental information management and delivery systems. This plan will include a list of deliverables and specific milestones for measuring DNREC's progress toward its goals.
2. ***Design the Environmental Information System:*** DNREC will bring together key stakeholders from the public, the regulated community, other agencies, and the Department to determine the functionality desired for the system and general priority for implementation.
3. ***Develop Data Standards, Policies, and Business Rules:*** In concert with EIS design, DNREC will review and establish as appropriate data standards, organizational structure, business processes and policies that ensure data consistency across the Department.
4. ***Evaluate and Reconcile Existing Data:*** DNREC will evaluate its existing data to determine which data sets are in a format that can be easily loaded into the EIS. DNREC will determine which data sets will need major reforming and/or quality checking before loading into EIS, and which data sets have not been compiled into accessible databases.
5. ***Load Data into EIS:*** DNREC will load data into the EIS starting with cleanest and most complete data set identified in Step 3. As each additional data set is added, sites will be matched against sites already in the database to ensure that duplicate sites are not entered.
6. ***Create New Program-specific Databases where Needed:*** Program specific databases will need to be created for programs that are not now storing their data electronically. Database development will be prioritized based on need for the data outside the program and the desire and ability of the program to maintain the database.
7. ***Modify Existing Databases to be Consistent with EIS:*** This task will begin when EIS Design, Data Standards and Policies tasks are complete.
8. ***Expand Electronic Reporting Opportunities:*** DNREC will form stakeholder committees to identify opportunities for expanded electronic reporting by the regulated community. Both transmittal of data in files attached to e-mail or on magnetic media and direct input of data into interactive forms on the Internet will be evaluated.
9. ***Include Wetland and Subaqueous Lands Section Activity in the Technology Enabled Permitting (TEP) System:*** DNREC will expand its TEP system developed

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for domestic water well and septic systems to include wetlands, and sub aqueous, permits.

## **Data Categories For Inclusion In EIS**

### **Integrated Basic Facility Data**

*Name, location, owner, contacts, activities of interest to DNREC*

### **Facility Permit Data**

*Type, expiration data, scanned documents, text(?)*

### **Facility Compliance Data**

*Violations*

### **Facility Activity Data**

*Emissions, TRI, hazardous waste generated, waste landfilled, NPDES discharges*

### **Facility Monitoring Data**

*Ground water, surface water, sediment and air monitoring*

### **Facility Correspondence**

*Scanned documents*

### **Ambient Surface Water Data**

*STORET data*

### **Ambient Air Quality / Sediment Data**

*Collected by DNREC AQM, STORET data, special studies*

### **Ambient Natural Resources Data**

*Natural heritage data, fish surveys, benthic surveys, waterfowl surveys*

### **Climate / Weather Data**

*Mostly collected by other agencies*

### **GIS Base Coverages**

*Roads, water, political boundaries*

### **Natural & Human Resource Coverages**

*Soils, wetlands, census data, land use/land cover, protected lands*

### **Criminal Records**

*Mostly records held by other state, federal, or local governments*

## **Building and Deploying**

A high level design of and a development strategy for the EIS was finalized in April 2000. A final Data Standards was also published at the same time. The Information Flow Survey was finalized in March 2000. DNREC also evaluated similar systems developed by PA, NJ, ME, WA, and OR. Following additional tasks were completed by July 2000.

- Selected development tools for the EIS
- Installed SQL Server database on the DNREC's EIS server

An RFP to select vendors for the development of EIS was floated in July 2000 with the help of Division of Purchasing. Three vendors were selected and awarded contracts in the last week of September 2000.

Phase I of the implementation of EIS was completed in January, 2001 with the importation of databases of Air Quality Program and the Surface Water Discharge Program (NPDES) into the

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EIS. The system is now available on the intranet for the Department staff and on the Internet for the public to view. This has the GIS component also incorporated into it. In addition databases were developed and incorporated into EIS for programs such as Sediment Control, Parks and Recreation, and Salvage Yards.

Phase II of EIS to import the databases of Solid Waste Program, Hazardous Waste Program, and Underground Tank Program was completed in January 2002. Currently these databases are being tested.

Phase III involves importing databases from Superfund Program. Septic and groundwater programs and Wetlands program. These are expected to be completed by September 2002.

Phase IV comprising Ambient Water and Air Quality Data and databases from non regulatory programs such as Animal Operations, Dredge and Spoil Areas, Pesticide Sites, Sludge Application, Spray Irrigation etc will be incorporated into EIS. These activities are expected to be completed by June 2003.

The Department has \$750,000 available to complete phases III and IV.

Phase V will cover all the Natural Resource programs such as Fish and Wildlife, Beach Preservation and Parks and Recreation. The estimated cost of this phase is \$435,000. This phase will be undertaken as soon the funding becomes available in FY 2003/2004.

EquIS, an analytical tool for environmental analytical data will also be incorporated into EIS during the latter part of 2002. The software has been acquired and installed. Data from the Department's Laboratory Information Management System will be loaded into EQuIS beginning June 2002.



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## Burden Reduction



DNREC has a number projects aimed at reducing burden to the regulated community, public and its own staff. The COMPAS system, which assists Kent County Planners in making zoning decisions, allows the planners to do now in only 15 minutes what used to take hours or days. DNREC's technology Enabled Permitting System, which combines well and septic permits and provides an online transaction processing system, reduced the number of steps in the permitting process from 118 to 20, reduced staff needed for permitting from 18-14, decreased permit turnaround time from 10 days to 1 or less, and reallocated more experts to the field. The Waste Transporters Permit System has resulted in productivity improvements of over 20% for DNREC staff and better service for permittees.

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## **eGovernment Initiatives**

DNREC is embarking on a number of eGovernment initiatives to reduce the burden of the regulated community. The legislature has appropriated \$500,000 in FY 2002 towards these initiatives. Following is a summary of the initiatives currently on the drawing board:

### **1. Fishing/Hunting Licenses, Boat Registration, and Sale of Duck Stamps and Park Passes:**

Currently fishing/hunting licenses, boat registration and duck stamps are sold through mail or at stores authorized to sell them. About 24,000 fishing licenses, and 20,000 hunting licenses are issued annually. About 44,000 boat registrations currently exist which are renewed, depending on the registration, on a one year, two year or three year cycle. Public can download the form from the internet to request these items, fill out the form and mail it to Fish and Wildlife Division along with the check. As soon as the request is received, it is processed and the items are mailed back. The whole process takes 10 to 13 days depending on the efficiency of the postal system.

Park passes are sold at the Park offices only. About 26,000 passes are sold annually.

These licenses, stamps or the boat registration could be sold over the internet by requiring the applicant to fill out the necessary information and allowing them to make payment using credit card using a credit card processing system. This will cut down the processing period by 3 to 6 days for licenses and stamps. As for park passes this will allow the public to have passes delivered at home instead of driving to the nearest park office.

If the current statutory requirement of wearing back tags for fishing and hunting licenses is eliminated the public can print the licenses at home using their printer thus making the process instantaneous. The boat registration, duck stamps and park passes will still have to be mailed.

The applicant information can be captured into a database for the Department's use.

### **2. Payment of Underground Tank fee, contractor registration fee and vapor recovery fee:**

Currently the facilities pay these fees by check by mail upon receipt of the appropriate invoices. There could be considerable saving in the processing efforts of the Department for the collection of these fees by handling the payment electronically over the internet. The facilities could receive the invoice over the internet and make the payment using credit card over the net.

### **3. Waste Water Discharge Monitoring Reports:**

The NPDES program receives the DMRs in paper form, which is then manually entered into the database and exported to EPA. Almost one half of FTE is devoted to this data entry task. We have already developed a web based data entry form which can be made available over the web for the facilities to enter the DMRs. The data would then directly go into the EIS. This, when

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fully utilized by the industry, could result in the saving of one half FTE. We need to ensure the security of the data submitted using some form of electronic signature, the cost of which varies significantly.

#### **4. Well and Septic License:**

The Technology Enabled Permitting system of Septic and Well licensing programs could realize the full potential of technology if the permit applications and the fees are processed over the web. This will eliminate the data entry into the EIS and the efforts thus saved could be put to better manage the programs. The system will use credit card processing and electronic signature over the net.

Other projects that could be considered depending the availability of funds are:

- Submittal of Hazardous Waste Manifest
- Submittal of Sediment and Erosion Control Notice of Intent applications and fees.
- Submittal of asbestos removal reports

The State is currently developing an ePayment system to allow payments of fees by credit card or debit card. This is expected to be completed by June 2002. The next step is to develop and implement the projects identified above. It is expected all the projects identified will be completed by July 2003.

DNREC is also automating a number of internal processes such as timekeeping, leave request and approval, processing of hiring papers, purchase order requests, payment vouchers etc. These together with Electronic Document Management and Work Flow that the Department planning to introduce over the next five years will result in considerable reduction in burden in the Department.

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## Public Access

DNREC has made public access to environmental information it is custodian of a high priority. This is being accomplished mainly by posting all the information on the Department's website (<http://www.dnrec.state.de.us>). DNREC recently revamped its website to an intention based portal, thus making it possible for the public to search for information on their area of interest without having any knowledge of the Department's organization structure.

The Department developed its Environmental Information System (EIS) as a web based system thus making it possible to place the system on its web site for public access. The EIS database on the web server is replicated nightly from the production database within the firewall. When fully developed by September 2002 the EIS will have information on over 12,000 facilities. When the Electronic Document Management System (EDMS) is implemented the facility related files will be linked to EIS, enabling the public to view all the documents in a facility's Department file over the web. The Department's Superfund Branch has over 1.5 million pages of its site files available over the web for the public to view. The Septic, Groundwater and Air Quality are the programs to introduce EDMS in FY 2002.

The Department is currently posting all the enforcement actions, violations, public notices and environmental releases on the web. This information is automatically replicated real time to the website as it is entered in the databases. The website also provides the facility for the public to subscribe to a List serv to be notified by email of all enforcement actions, violations, environmental releases, public notices, pesticide spraying, and beach monitoring.

A Beach Monitoring feature was added to the website to enable the public to view beach conditions. This provides results of water test, and a web cam.

The Department is developing an Environmental Release Notification system to notify interested public and all elected officials of significant environmental releases in their neighbor hood. The system will notify the subscribers to the system either by phone, fax or email of the release within 12 hours of the Department receiving the notification from the facility. The system is currently undergoing testing and will be released in March 2002.

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## Stakeholder Information

DNREC has initiated the involvement of stakeholders in the development of DNREC's integrated EIS. During preparation of the Source Water Assessment Plan in 1999, DNREC sought input from the public on its Environmental Navigator, precursor to the EIS. In addition, before the Navigator was launched, DNREC sought input from a stakeholder group consisting of environmentalist, industry representatives, and other government agencies. The Community Involvement Advisory Committee, composed of representatives from general public, industry, academia, local government, religious organizations, and environmentalist has reviewed the EIS as it went through the development phase. DNREC also involved stakeholders in developing a set of 14 environmental indicators.

Beginning July 2002 DNREC is planning a number of stakeholder meetings such as civic groups' meetings, church meetings, environmental groups meetings etc to showcase the EIS and seek their input to make it more user-friendly to the public.

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## Electronic Reporting

DNREC uses electronic reporting extensively in the Air Quality Program, the Site Investigation Program, and the NPDES Program. In the Air Quality Program, the TRI data and Tier II data under the Community Right to Know Act are being submitted electronically on diskettes or over the Internet. About 55% of the data in these categories are submitted electronically. DNREC intends to improve the process of electronic reporting by web enabling the reporting system. In the Site Investigation Program, lab data are being received using EquIS's Electronic Data Delivery (EDD) module. DNREC is involved in Delaware's statewide e-government initiative.

DNREC is currently developing an online reporting system for the industries to submit the annual Emissions Inventory to the Department. It is expected that about 100 facilities will participate in the online reporting to be launched in April 2002.

DNREC is also participating in the pilot eDMR project developing electronic reporting system for facilities to submit Discharge Monitoring Reports (DMR) electronically to the Department.

DNREC is an active participant in EPA's Central Data Exchange (CDX) Network currently under development. Once fully functional CDX will act as the central receiving depository for all of the reports currently EPA receives separately from each of its delegated programs such as Clean water Act, RCRA and Clean Air Act. DNREC developed a pilot node using Biztalk and XML and successfully transported facility data to CDX. DNREC will be participating in the Network Grant announced by EPA this year to develop a fully function node and participate in priority data exchanges identified by EPA for receiving Permit Compliance System (PCS) data, RCRIS data and Air Emissions data. DNREC intends to accomplish these data exchanges by December 2003.

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## **Geographic Information Systems**

DNREC has created a shared set of GIS base layers for the state. DNREC, in cooperation with Delaware's Department of Transportation, has also created digital orthophoto quads for the state with one-meter resolution. DNREC has created GIS coverages for nearly all facility types, for ambient monitoring sites, and for sensitive receptor locations in the state. DNREC program staff use several customized GIS applications in various environmental management activities.

GIS is an essential component of EIS. This enables public to view facility information via internet on a map of Delaware using the different layers identified above. DNREC developed this internet application using ESRI's Arc SDE, and Arc IMS softwares.

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## **Conclusion**

DNREC is well poised through the One Stop efforts to realize its Information Management vision of “making its information accessible to anyone from anywhere any time” by FY 2006. This will result in a true eGovernment greatly enhancing the ability of the public to deal with DNREC more efficiently and effectively, reducing the burden for the regulators and the regulated community and making one stop reporting a reality.